

## Community Surface Water Sanitary Survey Form

Date: \_\_\_\_\_

Date of last survey: \_\_\_\_\_

Inspector(s): \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

### **Utility Information**

PWSID: \_\_\_\_\_

Utility name: \_\_\_\_\_

Mailing address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Contact person: \_\_\_\_\_

Alternate contact: \_\_\_\_\_

Telephone: \_\_\_\_\_

Fax: \_\_\_\_\_

Other phone: \_\_\_\_\_

### **Service Connections**

Number of metered connections \_\_\_\_\_

Number of unmetered connections \_\_\_\_\_

Population \_\_\_\_\_

### **Operator Information**

Utility superintendent: \_\_\_\_\_

Chief operator: \_\_\_\_\_

Class:(circle one)    I    II    III    IV

Other operators: \_\_\_\_\_

Class:(circle one)    I    II    III    IV

\_\_\_\_\_

Class:(circle one)    I    II    III    IV

\_\_\_\_\_

Class:(circle one)    I    II    III    IV

\_\_\_\_\_

Class:(circle one)    I    II    III    IV

Distribution personnel: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### **Inspection Summary**

#### **Violations:**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

#### **Recommendations/requirements:**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## Watershed Characteristics

### General Information

Name of source: \_\_\_\_\_

Source type (river, lake, etc.): \_\_\_\_\_

Characterization of the watershed:

- I. **Completely controlled:** one road in watershed and no access except for district personnel
- II. **Substantially controlled:** very few roads, limited access, immediate shoreline owned by watershed
- III. **Moderately controlled:** few roads in watershed, some access, shoreline owned or controlled by the district, moderate activity
- IV. **Partially controlled:** several roads in watershed, controlled access to source, low to moderate control over watershed
- V. **Minimally controlled:** many roads in watershed, little control over shoreline, and moderate to high use of the watershed
- VI. **Uncontrolled:** many roads in watershed, no control over shoreline, and vast use of the watershed

### Raw Water Monitoring

What are the results of the system's *Giardia lamblia*, and *Cryptosporidium* monitoring? \_\_\_\_\_

\_\_\_\_\_

Which of the following does the water system routinely monitor?

- |   |  |                                      |
|---|--|--------------------------------------|
| <input type="checkbox"/> Transparency (Secchi disk) | <input type="checkbox"/> Total phosphorous | <input type="checkbox"/> Temperature |
| <input type="checkbox"/> Dissolved oxygen           | <input type="checkbox"/> Chlorophyll-a     | <input type="checkbox"/> Alkalinity  |
| <input type="checkbox"/> Apparent color             | <input type="checkbox"/> pH                | <input type="checkbox"/> Turbidity   |
| <input type="checkbox"/> VOC's                      | <input type="checkbox"/> Pesticides        | <input type="checkbox"/> Herbicides  |

Which conditions change water quality? \_\_\_\_\_

\_\_\_\_\_

### Watershed control

Is a shoreline buffer zone owned or controlled by the utility?: \_\_\_\_\_

Does the utility have an active program for watershed acquisition or control?: (yes/no)

Are portions of the watershed controlled by land owner agreements or zoning?: \_\_\_\_\_

Is existing watershed control sufficient?: \_\_\_\_\_

Is the watershed posted as a drinking water source? \_\_\_\_\_

### Industrial and Commercial Pollution Sources

Are there any industrial discharges in the watershed?: (yes/no)

Describe operation and potential contaminants: \_\_\_\_\_

\_\_\_\_\_

Are zoning restrictions in place that control manufacturing in the watershed?: (yes/no)

## **Intake Restrictions**

How many intakes are in use? \_\_\_\_\_ Are they at different locations/depths? \_\_\_\_\_

Is the intake location and 400' no entry zone clearly marked with buoys? (yes/no) \_\_\_\_\_

Do signs indicate that the area near the intake is a public water supply? \_\_\_\_\_

What type of screen is used on the intake? \_\_\_\_\_

Does the intake have an air scouring system? ☐ yes ☐ no

How often are intakes inspected? \_\_\_\_\_ When was the last time the intake was inspected? \_\_\_\_\_

Is the inspection schedule adequate? (yes/no) \_\_\_\_\_

## **Animal Contamination Sources**

Are there any zoning restrictions in place that restrict animal (farm) populations in the watershed?: (yes/no) \_\_\_\_\_

Are there beavers or other varmints in the watershed? (yes/no) \_\_\_\_\_ Are they removed? (yes/no) \_\_\_\_\_

## **Recreational Activities**

Is there a boat launch near the intake? \_\_\_\_\_

Is ice fishing allowed on this source? \_\_\_\_\_

Are motorized vehicles allowed on the water source during the winter? (yes/no) \_\_\_\_\_

Are warnings placed near the intakes in the winter? \_\_\_\_\_

List the primary sources of human contamination. \_\_\_\_\_  
\_\_\_\_\_

## **Mapping**

Does the utility have a map of the watershed delineating contour lines, property ownership, etc? \_\_\_\_\_

Does the town office / offices w/in watershed have a watershed map for planning purposes? \_\_\_\_\_

Does the district use GIS technology for watershed mgt? \_\_\_\_\_

Watershed notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **Other Sources/Connections:**

	<b><u>Source Name</u></b>	<b><u>Actively used?</u></b>	<b><u>Estimated Yield (GPD)</u></b>
Source 1			
Source 2			
Source 3			
Source 4			

## Treatment Plant

Design engineer: \_\_\_\_\_

Date of construction: \_\_\_\_\_

### **Production Capacity**

Average summer production (MGD): \_\_\_\_\_

Average winter production (MGD): \_\_\_\_\_

Max. daily production(MGD): \_\_\_\_\_

Design flow (MGD): \_\_\_\_\_

### **Raw / Finished Water Pumping**

	Raw Water Pumps				Finished Water Pumps			
Pump number	1	2	3	4	1	2	3	4
Pump capacity (GPM)								
Horsepower rating								
Type of pump								
Manufacturer								
Last service date								
Condition of pump								
VFD equipped?								

Is all rotating equipment with guards?: ☐ yes ☐ no

Are NSF approved lubricants used on bearings, etc? ☐ yes ☐ no

### **Emergency Preparedness**

Are emergency backup systems provided?: \_\_\_\_\_

Is the generator routinely exercised under load? \_\_\_\_\_

Does the water system have pump station generators too? \_\_\_\_\_

Do backup systems power entire plant or just parts? \_\_\_\_\_

Is the system's emergency preparedness plan up to date? \_\_\_\_\_

Who is notified and how?: \_\_\_\_\_

**Notes:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Sketch the schematics of the filter plant indicating source, wetwell, filters, clearwells, etc. Indicate chemical injection points if possible.

Chemicals added				
Chemical	Name	Dose (mg/l)	Name	Dose (mg/l)
Coagulation				
Disinfection				
Corrosion control				
Fluoridation				
Other				

Are all chemicals NSF / AWWA approved? ☐ yes ☐ no

Are all chemicals properly stored? ☐ yes ☐ no

Are chemical lines pinched or chafing? ☐ yes ☐ no

Is district staff trained to handle chemical spills? \_\_\_\_\_

Is proper safety equipment available to staff? \_\_\_\_\_

Notes: \_\_\_\_\_

\_\_\_\_\_

---

---

## Wetwell, Coagulation and Rapid Mixing

### Wetwell

Number of wetwells: \_\_\_\_\_

Volume: \_\_\_\_\_ Depth (ft.): \_\_\_\_\_ Width (ft.): \_\_\_\_\_ Length (ft.): \_\_\_\_\_

Is the wetwell protected from spilled fluids running into it?: ☐ yes ☐ no

Where do floor drains go? \_\_\_\_\_

### Coagulant

What type of coagulant is used? \_\_\_\_\_

Have other types been tried? \_\_\_\_\_

Notes: \_\_\_\_\_

### Rapid Mix

Type of Mixer: ☐ mechanical ( \_\_\_\_\_ hp) ☐ static ☐ other \_\_\_\_\_

Is rapid mix rate variable? \_\_\_\_\_

Notes: \_\_\_\_\_

### Flocculation Basin

Number of floc basins used: \_\_\_\_\_

Type of mixer: ☐ paddle wheel ☐ turbine ☐ hydraulic ☐ other \_\_\_\_\_

Current operating speed (rpm): \_\_\_\_\_

Is mixing speed variable?: ☐ yes ☐ no

Depth (ft.): \_\_\_\_\_ Width (ft.): \_\_\_\_\_ Length (ft.): \_\_\_\_\_

Volume: \_\_\_\_\_ ft<sup>3</sup>

Detention time at maximum flow rate (min.): \_\_\_\_\_

Describe the floc characteristics in this process: \_\_\_\_\_

Are jar tests or streaming current detectors used to control coagulant dosing? \_\_\_\_\_

Coagulation notes: \_\_\_\_\_

## Sedimentation and Clarification

### Sedimentation basin

Number of units installed: \_\_\_\_\_

Has a  $T_{10}$  value been calculated?: \_\_\_\_\_

Has a  $T_{10}$  value been verified by tracer study?: \_\_\_\_\_

Volume of each basin (gal): \_\_\_\_\_

Depth (ft.): \_\_\_\_\_ Width (ft.): \_\_\_\_\_ Length (ft.): \_\_\_\_\_

Describe the basin: \_\_\_\_\_

\_\_\_\_\_

Describe the floc in the sed basin: \_\_\_\_\_

\_\_\_\_\_

**What is post-sedimentation turbidity?** \_\_\_\_\_ NTU

### Clarifiers

Clarifier manufacturer: \_\_\_\_\_ Clarifier type: \_\_\_\_\_

Number of clarifiers in use: \_\_\_\_\_ Volume of each unit (gal): \_\_\_\_\_

Depth (ft.): \_\_\_\_\_ Width (ft.): \_\_\_\_\_ Length (ft.): \_\_\_\_\_

Date clarifier media was last inspected: \_\_\_\_\_

Special equipment: ☐ Lamella plates ☐ tubes ☐ other: \_\_\_\_\_

Are taps provided to sample clarified water?: (yes/no)

**What is post-clarification turbidity?** \_\_\_\_\_ NTU

### Clarifier flushing

Is a flush to waste procedure used? ☐ yes ☐ no

Flush frequency (hours): \_\_\_\_\_ Flush volume (gal): \_\_\_\_\_

Clarifiers are flushed with: ☐ raw water ☐ filtered water ☐ finish water

Is flush water recycled to headworks?: (yes/no) If yes, percentage recycled: \_\_\_\_\_

**What is recycle water turbidity?** \_\_\_\_\_ NTU

Which of the following controls flush frequency? ☐ Head loss ☐ turbidity ☐ time

Is air scouring used during flushing?: ☐ yes ☐ no

**Notes:** \_\_\_\_\_

\_\_\_\_\_

## Filtration and Backwashing

### Filtration Process

Type: ☐ Conventional ☐ Direct ☐ Slow Sand ☐ Other \_\_\_\_\_

Filter manufacturer: \_\_\_\_\_

Number of filters in use: \_\_\_\_\_ Design flow rate per filter: \_\_\_\_\_

Depth (ft.): \_\_\_\_\_ Width (ft.): \_\_\_\_\_ Length (ft.): \_\_\_\_\_

Date the filter media was last changed or regenerated: \_\_\_\_\_

Date filter media was last inspected: \_\_\_\_\_

Is surface wash used to clean the filters? ☐ yes ☐ no

Is air scour used to clean the filters? ☐ yes ☐ no

Is there a turbidity meter on each filter? ☐ yes ☐ no

Notes: \_\_\_\_\_

### Filter media

Media Layer	Depth of media (in.)	Type of media*
1 (top)		
2		
3		
4		
5 (bottom)		

\*Types of media: anthracite, garnet, GAC, sand, gravel, support gravel

How is media loss measured? \_\_\_\_\_

Is media occasionally sent to manufacturer for analysis? \_\_\_\_\_

### Backwashing

Backwash frequency (hours): \_\_\_\_\_ Backwash volume (gal): \_\_\_\_\_

Does the system backwash with clean water? ☐ yes ☐ no

Is the backwash recycled? ☐ yes ☐ no Percentage recycled: \_\_\_\_\_%

Backwash of filters is triggered by which of the following parameters?

☐ Headloss ☐ Turbidity ☐ Particle Counts ☐ Time

Is filter to waste used? ☐ yes ☐ no

**What is the average filtered water turbidity?** \_\_\_\_\_ NTU

What criteria are used to determine when a filter goes back on line?: \_\_\_\_\_

Do turbidity records indicate spiking after startup? \_\_\_\_\_

Will the plant shut down on high turbidity? How high? \_\_\_\_\_

Has the system used a particle counter to optimize filter performance? \_\_\_\_\_

**Filtration/backwash notes:** \_\_\_\_\_



## Disinfection and Contact Time

### Disinfection

Is there a continuous disinfectant analyzer? ☐ yes ☐ no

Will a lack of disinfectant enable one of the following? ☐ generator backup ☐ automatic shutdown

What is shut down limit? \_\_\_\_\_

Is disinfectant stored and applied safely? \_\_\_\_\_

Describe disinfection system operation. \_\_\_\_\_

Notes: \_\_\_\_\_

### Clearwell

Number of units installed: \_\_\_\_\_ Design flow rate per unit: \_\_\_\_\_

What is the approximate baffling factor: \_\_\_\_\_ (0 for no baffling, 1 for plug flow)

T<sub>10</sub>: \_\_\_\_\_ (from tracer study)

Volume per unit (gal): \_\_\_\_\_

Depth (ft.): \_\_\_\_\_ Width (ft.): \_\_\_\_\_ Length (ft.): \_\_\_\_\_

### Contact Basin

Number of units installed: \_\_\_\_\_ Design flow rate per unit: \_\_\_\_\_

Baffling factor: \_\_\_\_\_ T<sub>10</sub>: \_\_\_\_\_ (from tracer study)

Volume per unit (gal): \_\_\_\_\_

Depth (ft.): \_\_\_\_\_ Width (ft.): \_\_\_\_\_ Length (ft.): \_\_\_\_\_

Is contact time sufficient? \_\_\_\_\_

Is CT being properly recorded? \_\_\_\_\_

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Monitoring and Distribution

### Monitoring Equipment

Do alarms notify an autodialer or emergency services? \_\_\_\_\_

Can the plant be started or stopped remotely through a SCADA system? \_\_\_\_\_

Has the system used a particle counter, zeta potential meter etc. to increase process monitoring? \_\_\_\_\_

Notes: \_\_\_\_\_

### In-Plant Cross Connections

Were any cross connections observed? \_\_\_\_\_

Any connections to cooling water, boilers, makeup lines, potable supply, hoses, drains? \_\_\_\_\_

### Distribution System

What and where is the low pressure (near 20 psi at curb stop) in the distribution system? \_\_\_\_\_

How many limited service agreements does the system have? \_\_\_\_\_

Are plans of the distribution system available and current? ☐ yes ☐ no

What are the results of the system's hydraulic model? \_\_\_\_\_

Below, list the materials used for piping in the distribution and transmission systems.

Transmission Pipe	Length	Distribution Pipe	Length
Plastic		Plastic	
Cast iron		Cast iron	
Ductile iron		Ductile iron	
Wood		Wood	
Concrete		Concrete	
Galvanized Steel		Galvanized Steel	
AC - Asbestos Cement		AC - Asbestos Cement	
Copper		Copper	

How often are the lines flushed? ☐ spring ☐ fall ☐ both

Is this system adequate? ☐ yes ☐ no

How many bleeder lines are in continuous operation? \_\_\_\_\_

Are dead ends in the system monitored for contamination? \_\_\_\_\_

How many hydrants are on the system? \_\_\_\_\_ Are all hydrants plugged?: (yes/no)

What is the percentage of unaccounted for water? \_\_\_\_\_

### **Distribution (continued)**

Does the system have an active leak detection program? ☐ yes ☐ no

Does the system have a valve exercising program? ☐ yes ☐ no

Does the system have a capital improvement plan? ☐ yes ☐ no

How many people work on the distribution crew? \_\_\_\_\_

Is the distribution maintenance crew appropriate for the size of the network? ☐ yes ☐ no

Does the system have interconnections with neighboring systems or a contingency plan for outages?: (yes/no)

Notes: \_\_\_\_\_

\_\_\_\_\_

### **Public Education**

Is there an active public education program? ☐ yes ☐ no

Does the system publish a newsletter/billstuffers/homepage? \_\_\_\_\_

Does the system sponsor research at any colleges? \_\_\_\_\_

Does the system have frequent plant tours for schools/citizen groups? \_\_\_\_\_

### **System Storage**

Name of storage tank:				
Location of tank				
Volume of storage (gallons)				
Type of tank				
Manufacturer				
Date of construction				
Date of last inspection				
Is the site protected from vandalism?				
Can the tank be isolated from the system?				
Are overflows/drains screened properly?				
General tank condition: (good, bad, ugly)				

How many days of storage does the system have? \_\_\_\_\_ days

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## **Cross Connection Control**

Does the utility have a cross connection program (pop. >1,000)?: \_\_\_\_\_

Are approved backflow prevention devices installed at the following locations?:

<input type="checkbox"/> Nursing homes	<input type="checkbox"/> Hospitals	<input type="checkbox"/> Dentists' offices
<input type="checkbox"/> Doctors' offices	<input type="checkbox"/> Manufacturing plants	<input type="checkbox"/> Auto garages
<input type="checkbox"/> Mortuaries / funeral homes	<input type="checkbox"/> Waste treatment plant	<input type="checkbox"/> Fire stations

How often are these devices checked?: \_\_\_\_\_

Are double check assemblies installed in all new residential services?: ☐ yes ☐ no

Are double check assemblies tested/replaced during meter change out/inspection? ☐ yes ☐ no

## **Metering**

Are meters calibrated according to PUC regulations? ☐ yes ☐ no

## **Sampling**

### **Total Coliform Rule:**

How often are bacteria samples taken? \_\_\_\_\_

How often should samples be taken, based on current population data? \_\_\_\_\_

Does the D.W.P. have a coliform sampling site plan on file?: \_\_\_\_\_

### **Lead and Copper Rule**

Is the system meeting the action levels (1.3 for Cu, 0.015 for Pb)? \_\_\_\_\_

### **THM monitoring:** (systems over 10,000)

Does the system sample for THMs?: \_\_\_\_\_

Results of recent THM test: \_\_\_\_\_

Have THM numbers changed due to plant changes? How? \_\_\_\_\_

## **Staff Education**

Is system staff encouraged to pursue advanced licenses? \_\_\_\_\_

Do staff attend industry seminars/meetings? \_\_\_\_\_

Is staff active in industry organizations? \_\_\_\_\_

Notes: \_\_\_\_\_

\_\_\_\_\_

### **TC monitoring frequency for community water systems**

Population range		# of samples per month
25	1000	1
1001	2500	2
2501	3300	3
3301	4100	4
4101	4900	5
4901	5800	6
5801	6700	7
6701	7600	8
7601	8500	9
8501	12900	10
12901	17200	15
17201	21500	20
21501	25000	25
25001	33000	30
33001	41000	40
41001	50000	50
50001	59000	60
59001	70000	70
70001	83000	80
83001	96000	90
96001	130000	100

### **Summary of PUC regulations, Chapter 62 re. Meter Testing Frequency**

Unless permitted otherwise a water company shall adopt the schedule shown below for routine testing of meters:"

<u>Nominal Size of Meter</u>	<u>Years</u>	<u>Cubic Feet</u>
5/8"	8	100,000
3/4"	8	150,000
1"	8	300,000
1 1/2"	6	-
2"	6	-
3"	4 Field	-
4"	2 Field	-
6"	1 Field	-

### **Contact Time Worksheet**

#### **Step 1: Determine the time available in the basin at peak flow**

- A. basin volume \_\_\_\_\_ gallons
- B. baffling factor \_\_\_\_\_
- C. Peak hourly flow \_\_\_\_\_ gallons per minute
- D. Time available \_\_\_\_\_ minutes

#### **Step 2: Determine the contact time available at peak flow**

- E. Time (from "D" above) \_\_\_\_\_ minutes
- F. Chlorine concentration \_\_\_\_\_ mg/l
- G. Actual CT \_\_\_\_\_ min mg/l

#### **Step 3: Find the required CT from the tables at peak flow**

- H. Required CT \_\_\_\_\_ min mg/l

#### **Step 4: Does your water system meet CT requirements?**

- I. Actual CT (from "G" above) \_\_\_\_\_ min mg/l
- J. Required CT (from "H" above) \_\_\_\_\_ min mg/l
- K. CT ratio (actual / required) \_\_\_\_\_
- L. Is CT ratio greater than or equal to 1.0 (yes or no)?\* \_\_\_\_\_